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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/645,913	08/25/2000	Yuliya Anatoyevna Akulova	3-12-10	6849

7590 05/30/2003  
Lester H. Birnbaum  
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EXAMINER

ESTRADA, MICHELLE

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/645,913

Applicant(s)

AKULOVA ET AL.

Examiner

Michelle Estrada

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) 32-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13-21, 23 and 26-31 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 22, 24, 25 and 59-62 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains: Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sawada (5,258,632) and the following comments.

Sawada disclose forming a first dopant blocking layer (3) and forming a second dopant blocking layer (7); forming a third dopant blocking layer (5) between said first and said second dopant blocking layers; said first dopant blocking layer has a substantially uniform thickness.

Sawada does not specifically disclose that the first dopant blocking layer is formed at a first temperature and that the second dopant blocking layer is formed at a second temperature.

One of ordinary skill in the art would had led to the desire temperatures through routine optimization to achieve desired deposition rates for example. In the event that the reference suggests employing the same temperatures in the deposition steps it would have been obvious to employ a first temperature lower than the second temperature by an amount that would be insufficient to substantially alter the disclosed process with the expectation that the substantially disclosed results would be obtained.

Claims 4-9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sawada and the examiner's comments as applied to claims 1-3 above, and further in view of Hirayama et al. (5,608,230).

The combination of Sawada and the examiner's comments does not disclose wherein said first dopant blocking layer is formed over a vertical sidewall of a mesa and over a horizontal surface of a substrate; wherein said first and second dopant blocking layers are InAlAs; wherein the third dopant blocking layer is chosen from the group consisting of InP, InGaP, InGaAs, or InGaAsP.

Hirayama et al. disclose wherein said first dopant blocking layer (5) is formed over a vertical sidewall of a mesa and over a horizontal surface of a substrate; wherein said first and second dopant blocking layers are InAlAs; wherein the third dopant blocking layer is InGaAs (Col. 3, lines 55-56 and Fig. 1).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Sawada, examiner's comments and Hirayama et al. to enable formation of the dopant blocking layers.

Choice of a particular temperature and thickness of the dopant blocking layers would have been a matter of routine optimization. See MPEP 2144.05.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sawada and examiner's comments as applied to claims 1-3 above, and further in view of Morimoto (5,753,933).

The combination of Sawada and examiner's comments does not disclose that said first and second dopant blocking layers are InGaAlAs.

Morimoto discloses InGaAlAs as a suitable material for dopant blocking layers (Col. 7, line 53).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Sawada, examiner's comments and Morimoto to enable formation of the dopant blocking layers.

Claims 14-21 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sawada and examiner's comments as applied to claims 1-3 above, and further in view of Brar (6,414,340).

The combination of Sawada and examiner's comments does not disclose wherein said first and second dopant blocking layers are formed by MOVPE or MBE; wherein said first and second dopant blocking layers are InAlAs.

Brar discloses forming barrier layers either by MBE or MOVPE (Col. 5, lines 33-34); and wherein the first barrier (18) and the second barrier (24) are InAlAs.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Sawada, examiner's comments and Brar to enable formation of the barrier layers.

Choice of a particular temperature would have been a matter of routine optimization. See MPEP 2144.05.

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Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sawada, examiner's comments and Hirayama as applied to claims 4-9 and 13 above, and further in view of Brar (6,414,340).

The rejection is applied as stated above.

### ***Response to Arguments***

Applicant argues Sawada's layers are not "dopant blocking layer" because there is no teaching in Sawada that these layers would be capable of blocking dopants. However, Sawada's layer are "dopant blocking layers" because they make slow or difficult the passage or progress of ions diffusing through the layer.

Applicant argues that Morimoto does not disclose forming the layer at different temperature. However, Morimoto was not relied on upon for that purpose.

### ***Allowable Subject Matter***


Claims 11, 12, 22, 24, 25 and 59-62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is (703) 308-0729. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
George Fourson  
Primary Examiner  
Art Unit 2823

  
MEstrada  
May 21, 2003